

# Test Review

Learning Set 1 & 2

1. When Mendel crossed true-breeding tall pea plants with a true-breeding short plants what were the results of the F1 generation?

- 100% Tall, Tt
- 0% Short, tt

	T	T
t	Tt	Tt
t	Tt	Tt

What were the results of the F2 generation? Complete the Punnett square for the F2 generation.

- 25% short plants-  $tt$
- 75% Tall plants-  $TT$ ,  $Tt$

	T	t
T	TT	Tt
t	Tt	tt

How do these results relate to the data received from RBWI on the crossing of Type-A red grained rice and Type-B white grained rice.

Same results as Mendel's Pea Plants.

100% Tall, Rr

0% short, rr

	R	R
r	Rr	Rr
r	Rr	Rr

# Definitions and examples

- Heterozygous: Organism has two **different alleles** for the same gene. **Bb, Tt.**
- Homozygous: An organism has two **identical alleles** for a particular gene. **BB, bb, TT, tt**

# Definitions and examples

- Dominant: Allele masks (hides) the expression of the recessive trait. **TT, Tt.**
- Recessive: Allele whose expression is masked by the dominant allele. **tt.**

# Definitions and examples

- Purebred: Same as homozygous.  
**BB, bb.**
- Hybrid: Same as heterozygous.  
**Bb.**

3. What are some of the differences and similarities between Huntington's disease and sickle-cell anemia?

- **Similarities:** Genetic disease, mutation in the gene.
- **Differences-**
  - Huntington's disease is caused by a dominant allele and Sickle-cell anemia is caused by a recessive allele.
  - Huntington's disease affects the nervous system and sickle-cell affects the red blood cells.



## 4. Cystic Fibrosis

- A person who has the allele for cystic fibrosis, but does not have the disease is known as a **Carrier** for that disorder.
- Is it possible for their offspring to inherit this disease from them?

Yes. The disease is caused by a recessive trait, so if each parent is heterozygous (Cc) for the disease then the parents have a 25% chance of having a child with CF.

5. If there are 90 people in a room, statistically, how many of those people would be carriers for cystic fibrosis?

- 1 out of every 30 Americans are carriers of CF, so **3 out of 90** would be carriers.

6. Describe the difference between genotype and phenotype of an organism.

- Genotype: The genetic makeup of an organism.
  - BB, Bb, bb.
- Phenotype: Is the physical characteristics of an organism.
  - Brown eyes, blonde hair.

A man who is **heterozygous** for his connected eyebrow marries a woman who does not have connected eyebrows. What is the probability that they will have a child with connected eyebrows?

- 50% Connect eyebrow
- 50% not connected eyebrow

	C	c
c	Cc	cc
c	Cc	cc

8. What is the probability that two cats that are heterozygous for long hair will have a kitten with short hair?

L= long hair   I= short hair

- 75% Long hair
- 25% short hair

	L	I
L	LL	LI
I	LI	II

# Definitions

- Trait: Physical or behavioral characteristic of an individual that can be passed down to the next generation.
- Variation: differences among individuals in a group.

# Definitions

- Genetics: The science of how characteristics are passed down from one generation to the next.
- Sample: A piece or a part taken from the group, whose properties are studied to gain information about the whole.

# Definitions

- Staple food: A basic or necessary food.
- Grain: Usually a type of grass grown for its edible seeds.
- Photosynthesis: A process in which green plants use the energy from sunlight along with carbon dioxide and water to make their own food.